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ABSTRACT

SEEN (Seeing Eye Elephant Network) is a computer program intended to help students write better essays by providing a heuristic for invention and a means for audience feedback. In the solo mode, the program prompts students to perceive what they have seen--that is, to consider the literary work in an active way. The program also remembers--like an elephant--what the students say in answer to the program's prompts. In the network mode, students can share their work and get feedback by seeing how their work compares with others' views or by getting other students' comments on their work. In a tutorial that is currently being set up for a character analysis, the solo mode prompts students to provide and consider evidence in support of their own hypothesis, while the network segment is designed to help the students sharpen their critical insights by giving and getting feedback. In the fall of 1981 the program was tested on students in an introductory world literature class to determine if the students would improve their essay writing after using the computer program. A preliminary analysis of the data suggests that the improvement between the computer group and the noncomputer group is not statistically significant. However, the writing of the computer group did become much longer and more detailed, while failing and marginal students seemed to improve on the essay exam quite dramatically. (HOD)

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# A Computer Program for Invention and Feedback

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This paper reports on the theory, field testing and preliminary results of using a computer program in an introductory literature class. The program is intended to help students write better essays by providing a heuristic for invention and a means for audience feedback, two aids that are recommended in rhetorical theory. A microcomputer provided these aids on a one-to-one basis at a time convenient to students. Furthermore, the micro traced each student's activities and text-production at each session. This trace of activity allows a field test, in a way not previously possible, of rhetorical aids recommended in theory.

I set out to write a computer program that would provide a heuristic for invention (Winterowd, 1975; Young, Becker and Pike, 1970) and audience feedback in a non-threatening environment (Moffett, 1968; Emig, 1971; Barritt and Kroll, 1978; Kroll, 1978). These two writing aids also corresponded to the two modes of computer learning advocated by Professor Thomas A. Dwyer, an expert on educational use of computers: Dwyer has aimed to develop computer software to let people learn in solo simulations while still involving them in a

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network (See Dwyer, 1980). In my program, the heuristic corresponds to solo mode; the audience feedback to the network mode.

The computer can provide these aids--better than a workbook, because CAI is interactive, prompting; better for some students than a classroom because the computer goes at the student's pace, without authority figures or competitors.

Moreover, I programmed the computer to trace the student's process of thinking: the program not only records what the student writes in the solo/tutorial section, but also notes in the network section what the student saw and how s/he reacted.

For the heuristic, I chose not to go with the general approach of Burke's dramatistic pentad, the tagmemic matrix or Aristotelian topics. (Besides, these approaches had already been programmed, though without an audience component or a trace; Burns and Culp, 1980).

Instead, I remembered and analyzed the most agonizing writing situation I had ever faced: writing a paper for Music Appreciation in my junior year of college. I had listened to Brahm's Hungarian Dance #5 for hours. (I can still hum the tune 19 years later!) But I didn't know what to write!

Sound familiar? Many times I've found that the student in an introductory class is overwhelmed at the idea of writing an essay because s/he faces the same problem. That is, the student in an introductory class knows neither 1) what the discipline considers as evidence nor 2) the form or strategy acceptable in the discipline for

making an argument. It seemed to me that a heuristic would be most helpful if it were tailored to a discipline--that is, if it answered the student's question about the nature of evidence while prompting him or her to consider that evidence. Therefore, I developed a heuristic tailored for an introductory literature class--one which helped a student analyze a fictional character.

SEEN is that computer program: open-ended, interactive, with a heuristic to help a student generate ideas and with a network through which that student can share ideas with others. SEEN stands for Seeing Eye Elephant Network. In the solo mode, the Seeing Eye Elephant, the program prompts the student to "perceive" what s/he has "seen"--that is, to consider the literary work in an active way. The program also remembers--like an elephant--what the student says in answer to the program's prompts. In the network mode, the student can share his or her work and get feedback--by seeing how his work compares with others' views or by getting comments on his work written by other students.

The tutorial is currently set up for a character analysis, although alternate literary heuristics could easily be programmed. The following outlines the general format, the current application, and an actual response to the heuristic for character analysis (The sample responses were provided by a female Chemistry major who was a senior taking my World Literature class as a general education requirement, as described below.):

| General format | Particular application (w/ sample response) |
|---|---|
| Pick an X. | Name a fictional character X in a literary work (X = Satan in Paradise Lost) |
| Create hypothesis: X = Y | Describe the character X by completing the following: X is ____Y_____. (Satan is tricky.) |
| Argue that X = Y | Provide evidence to show that X is Y: |
| --regarding type A evidence | What does Satan do that shows Satan is tricky? (He enters the body of a serpent to disguise himself. . . .) |
| --regarding type B evidence | What does Satan say that shows Satan is tricky (He tells Eve lies about the tree of wisdom to get her to eat from it. . . .) |
| --regarding type C evidence | How do others react to Satan that shows Satan is tricky? (God had originally thrown Satan out of heaven because he didn't trust him.) |
| --regarding type D evidence | How does Satan compare to others in a similar situation and how does this show Satan is tricky? (The other angels do not compare themselves to God & are not thrown out.)* |
| --regarding type E evidence | If there is a 3rd person narrator, what does he say that shows Satan is tricky? (He says that Satan chooses the subtlest of beasts for his embodiment.) |
| Consider conflicting evidence | What evidence shows that Satan is not tricky? (Adam & Eve know that there is someone out to get them.)* |
| | In light of this evidence, you can now revise your notice, explain the apparent contradiction or leave the exception without comment. [The student "explained" her contradiction by adding the following: (but they don't know what he will do or what he will look like.) |

* Note that the program does not (and cannot) respond to inaccurate or unclear responses. That is a job for people, who respond on the Electric Bulletin Board.

While the solo mode, the Seeing Eye Elephant, prompts the student to provide and consider evidence in support of his or her own hypothesis, the network segment is designed to help the student sharpen his or her critical insights by giving and getting feedback. For example, after Kami wrote a full notice on Satan being tricky, she got indirect feedback by looking at a notice with a similar thesis:

TELFON SAYS THAT SATAN IN PARADISE LOST IS CLEVER
DOES: HE MAIPULATES EVE AND GETS HER TO EAT FROM THE TREE
HE PRESENTED HIMSELF AS A SERPANT
OTHERS: EVE IS FOOLED MANY TIMES BY HIS CLEVERNESS
HOWEVER: HE CONTRODICTS HIMSELF SLIGHTLY WHEN HETRIES TO
GET EVE TO EAT FROM THE TREE

Then she opted to see a comment written by the instructor (known to the students as Snoopy):

SNOOPY: CAN YOU BE MORE SPECIFIC? FOR EXAMPLE, HOW ARE ARGUMENTS CONTRADICTORY? ALSO, IS HE PARALLEL TO EVE IN WANTING TO BE GOD-LIKE? HOW DOES THIS SIMILAR SITUATION REFLECT ON SATAN'S CHARACTER?

This comment gives direction not only to Telfon, the notice-writer, but also to readers of the comment, like Kami. Furthermore, she has gotten support for ideas since Telfon's thesis and evidence are similar to hers. But she also recognizes a difference, and this pushes her to analyze and add the following comment on Telfon's

notice: "I agree, Satan is clever, however he must use lies to achieve what he wants."

When Kami logged on again, she got direct feedback from students comment on her notice:

HELEN: SATAN TELLS EVE THAT EVE WILL BECOME WISE AS HE HAS FROM EATING THE FRUIT. HE THEN TELLS EVE THAT GOD IS AFFRAID OF HER BECOMING LIKE HIM.

ZAPION: TRICKY SEEMS TO BE KIND OF A SOFT WORD FOR SATAN. HOWEVER, IT'S ABSOLUTELY TRUE.

Here Helen pushes Kami's argument along by providing more concrete evidence, and Zapion supports Kami, but makes a criticism about her thesis, too.

In Fall 1981, forty students in my introductory World Literature class volunteered to use the computer program (after the first exam). After this pre-test, the computer group was matched for statistical analysis with forty students not using the computer. For each "computer" student, I have 1) a pre-test, 2) a matched non-user of the CAI program, 3) printouts of the computer students' "notices" developed in the tutorial segment and any comments made on the students' "notices" on the network, 4) a trace of what notices and comments the student saw on the network, and finally 5) xerox copies of the students' essay exams.

My hypothesis was that students would improve their essay writing after using the CAI program. At this point, I still need to do a thorough statistical analysis of the computer group versus

the matched, non-computer group. More important, I need to complete a trace of each student within the computer sub-group. (The computer students were divided into four sub-groups with two groups getting substantive feedback from the instructor and two not getting instructor's feedback.)

At the moment, I have general impressions about the data. First, the CAI program didn't seem to hurt anyone. Statistically, the computer group did better than the non-computer group, but the improvement doesn't look statistically significant.

The qualitative differences are more interesting: Generally students' "notices" became much longer and more detailed as they used the program. Failing and marginal students seemed to improve on the essay exams quite dramatically. I conclude that the tutorial did show them what the discipline considers as evidence. And several students who got B's on the pre-test entered the A range on subsequent exams. But generally, although students' "notices" improved, students' essays on exams did not improve significantly. If a careful analysis bears out these impressions, then my next step will be to hypothesize about integrating CAI into the total learning environment. My goal will be to show students the form or strategy acceptable in the discipline for making an argument. Finally, I want to see whether the audience component helps students refine their ideas for clarity and accuracy. (At this point I have no hunches about what the data will show in this regard.)

Is the program worthwhile? Certainly the heuristic is. It helps students to read and react to literature actively. A common theme in student comments on the program is that SEEN got them to read differently--looking for specific kinds of evidence. That is, they not only "perceived" more in what they "saw," they also "saw" more.

I'm not sure yet about the value of the network. Perhaps it is just too clumsy in its present form, but could be more useful if programmed differently. Perhaps the test of their writing--a timed, in-class essay exam--was an inappropriately difficult way to test whether students were able to transfer their heightened perception of literature into essays that communicated their ideas in a form acceptable to the discipline. Or perhaps more emphasis should be placed on the strategies necessary to organize and communicate the ideas developed in the heuristic. These questions may be answered by a fuller analysis of my materials or in future field tests.

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